

CMCS 140 – Project 5 – Powerball by William Chrapcynski

Auto Pick Test Case

<u>Prompt</u>	<u>Input Value</u>	<u>Expected Output</u>	<u>Actual Output</u>
Choose auto or self pick	D	Error and loop	Error and loop
Choose auto or self pick	A	Number of tickets prompt	Number of tickets prompt
Number of tickets prompt	0	Error and loop	Error and loop
Number of tickets prompt	10	Powerplay prompt	Powerplay prompt
Powerplay prompt	6	Error and loop	Error and loop
Powerplay prompt	3	See tickets prompt	See tickets prompt
See tickets prompt	g	Error and loop	See tickets prompt
See tickets prompt	y	Show tickets Show winning ticket Show winning tickets if any Show total winnings Thank user	Show tickets Show winning ticket Show winning tickets if any Show total winnings Thank user

Self Pick Test Case

<u>Prompt</u>	<u>Input Value</u>	<u>Expected Output</u>	<u>Actual Output</u>
Choose auto or self pick	D	Error and loop	Error and loop
Choose auto or self pick	B	Number of tickets prompt	Number of tickets prompt
Number of tickets prompt	0	Error and loop	Error and loop
Number of tickets prompt	2	Powerplay prompt	Powerplay prompt
Powerplay prompt	10	Pick ticket #1 White #1	Pick ticket #1 White #1
Pick ticket #1 White #1	-1	Error and loop	Error and loop
Pick ticket #1 White #1	3	Pick ticket #1 White #2	Pick ticket #1 White #2
Pick ticket #1 White #2	6	Pick ticket #1 White #3	Pick ticket #1 White #3
Pick ticket #1 White #3	9	Pick ticket #1 White #4	Pick ticket #1 White #4
Pick ticket #1 White #4	12	Pick ticket #1 White #5	Pick ticket #1 White #5
Pick ticket #1 White #5	15	Pick Red ball ticket #1	Pick Red ball ticket #1
Pick Red ball ticket #1	30	Error and loop	Error and loop
Pick Red ball ticket #1	21	Pick ticket #2 White #1	Pick ticket #2 White #1
Pick ticket #2 White #1	10	Pick ticket #2 White #2	Pick ticket #2 White #2
Pick ticket #2 White #2	20	Pick ticket #2 White #3	Pick ticket #2 White #3
Pick ticket #2 White #3	30	Pick ticket #2 White #4	Pick ticket #2 White #4
Pick ticket #2 White #4	40	Pick ticket #2 White #5	Pick ticket #2 White #5
Pick ticket #2 White #5	50	Pick Red ball ticket #2	Pick Red ball ticket #2
Pick Red ball ticket #2	16	See tickets prompt	See tickets prompt
See tickets prompt	Y	Show tickets Show winning ticket Show winning tickets if any Show total winnings Thank user	Show tickets Show winning ticket Show winning tickets if any Show total winnings Thank user

Notes and Comments

This is definitely the toughest project that we've done and it did use all of the knowledge that I've learned so far. In some ways, though, it was a little easier since we had access to more tools to accomplish what needed to be done. Having more tools also made debugging a little easier than it had been in the past.

After I created the flow chart, I began writing code for what I considered the toughest areas. It took me a while to figure out the logic on how to make sure that each ticket didn't have any duplicate numbers for the white balls but it wasn't too bad. The key to this project was getting the proper sorting and learning what needed to be done to search through all the data. After that, it's just a matter of decide how you want to display it.

I used one large array for the user created tickets. Column 0-4 are the white balls. Column 5 are the red balls. Column 6 is a count of how many matches a ticket has with the white balls. Column 7 shows if the red ball of that ticket matches. Column 8 is used to set up what type of match (if any) a ticket has according to the rules of Powerball. That number is then used to help calculate how much money has been won. While I could have put the winning number in the same array, I thought it was best to keep it in a separate one so that there wasn't any confusion in the comparisons.

I have set up a debugging mode with a flag that gets set near the top of the main section of the program. This sets the winning number to a known set of numbers. This helped out with testing whether or not the winnings section was counting things properly. Debugging mode also outputs the ticket numbers at the end with the last three rows of the array userNumbers that have the tally count for number matches. This helped debug the code for comparing the winning number to the tickets.

I was able to implement the Power Play feature though, in my opinion, it's not exactly ideal. The can set the multiplier but it will be activated for all tickets created during that particular game. I did this so that the auto-pick numbers would make that play through very quick. I could have set it up to happen per ticket, though. That really wouldn't have been any more difficult.

I believe that I was able to catch any errors that the user might have caused with improper input. Using `cin.clear()` and `cin.ignore()` helped stop a lot of infinite loops that might have been caused if a character was entered where a number should be. An error message will be given if the output file for the winning tickets can not be recorded to but the program will continue.

I think that I was able to accomplish everything that was asked for in this project and it felt good to get it working properly. I wrote a lot of comments in my code to help keep things organized and it also helped when I needed to debug various sections. Creating debugging code helped out a lot as well. Thanks for teaching a great class! I'm looking forward to moving on to either Python or Java.

Screen Shot – Auto Pick

```
Welcome to the Powerball Lottery Game!
Please read the rules before playing:
1. Select your game mode: auto-pick or self-pick
2. Choose how many tickets that you'd like to buy
3. Randomize/input 5 white ball numbers (1-69)
4. Randomize/input 1 red ball number (1-26)
5. See if any of your tickets match the winning numbers!

Get ready to see if you have hit the jackpot of $999 Million Dollars!

Choose A or B:
A: Let Auto-Pick choose your numbers
B: Pick your own numbers
D
You must choose A or B
A
How many tickets do you want to purchase? (Maximum is 100): 0
You must choose between 1 and 100 tickets.
How many tickets do you want to purchase? (Maximum is 100): 10
Choose the Powerplay multiplier you would like.
This can multiple how much money you can win!
Choose 1(no multiplier), 2, 3, 4, 5 or 10: 6
You can only choose 1, 2, 3, 4, 5 or 10: 3

Would you like to see your tickets before the winning number is drawn? Y or N: g
You must choose Y for Yes or N for No.
y
Ticket #1 - 25 28 38 41 49 8
Ticket #2 - 25 26 36 51 59 12
Ticket #3 - 8 11 19 27 58 26
Ticket #4 - 2 4 5 32 54 21
Ticket #5 - 13 14 38 44 51 16
Ticket #6 - 1 19 26 51 59 24
Ticket #7 - 4 17 30 40 48 25
Ticket #8 - 8 35 39 49 55 3
Ticket #9 - 11 32 33 36 53 12
Ticket #10 - 12 32 44 51 57 9

The winning number is:
6 15 38 44 52 21

These are your winning ticket numbers (if any):
2 4 5 32 54 21

You have won a total of $12 dollar(s)!

Thank you for playing!
```

Screen Shot – Self Pick

```
Welcome to the Powerball Lottery Game!
Please read the rules before playing:
1. Select your game mode: auto-pick or self-pick
2. Choose how many tickets that you'd like to buy
3. Randomize/input 5 while ball numbers (1-69)
4. Randomize/input 1 red ball number (1-26)
5. See if any of your tickets match the winning numbers!

Get ready to see if you have hit the jackpot of $999 Million Dollars!

Choose A or B:
A: Let Auto-Pick choose your numbers
B: Pick your own numbers
D
You must choose A or B
B
How many tickets do you want to purchase? (Maximum is 100): 0
You must choose between 1 and 100 tickets.
How many tickets do you want to purchase? (Maximum is 100): 2
Choose the Powerplay multiplier you would like.
This can multiple how much money you can win!
Choose 1(no multiplier), 2, 3, 4, 5 or 10: 10
You will now choose your first five numbers (white balls) for ticket #1
Please pick five unique numbers from 1-60:
Please select your number for White #1
-1
You can only use numbers between 1 and 60.
Please select your number for White #1
3
Please select your number for White #2
6
Please select your number for White #3
9
Please select your number for White #4
12
Please select your number for White #5
15
You will now pick the number for the red ball for ticket #1
Please pick a number between 1-26:
30
You can only use numbers between 1 and 26.
21
You will now choose your first five numbers (white balls) for ticket #2
Please pick five unique numbers from 1-60:
Please select your number for White #1
10
Please select your number for White #2
20
Please select your number for White #3
30
Please select your number for White #4
40
Please select your number for White #5
50
You will now pick the number for the red ball for ticket #2
Please pick a number between 1-26:
16
Would you like to see your tickets before the winning number is drawn? Y or N: g
You must choose Y for Yes or N for No.
y
Ticket #1 - 25 28 38 41 49 8
Ticket #2 - 25 26 36 51 59 12
Ticket #3 - 8 11 19 27 58 26
Ticket #4 - 2 4 5 32 54 21
Ticket #5 - 13 14 38 44 51 16
Ticket #6 - 1 19 26 51 59 24
Ticket #7 - 4 17 30 40 48 25
Ticket #8 - 8 35 39 49 55 3
Ticket #9 - 11 32 33 36 53 12
Ticket #10 - 12 32 44 51 57 9

The winning number is:
6 15 38 44 52 21

These are your winning ticket numbers (if any):
2 4 5 32 54 21

You have won a total of $12 dollar(s)!

Thank you for playing!
```

Flowchart



